2017 NHTS Trip Chaining Dataset

Trip Chaining

In transportation planning a *tour* depicts trips that are linked together (*chained*) between two *anchored* destinations (home, work, and other), and provides insight into travel demand based on location, purpose, mode, etc. To obtain a more accurate estimate of the time and distance related to commuting and other anchored tours, and to help researchers in their quest for a better understanding of travel behavior, including trip chaining, the FHWA created a chained trip file for the last four surveys: the 2017, 2009 and 2001 NHTS and the 1995 NPTS. The 2001 and 1995 datasets were released as a set in 2005, with the 2009 dataset released shortly after the public use files were released. The 2017 trip chaining data were created using the same specifications.

The Components of a Tour

Day Trip	A trip record is one record of the NHTS Day Trip file. These trip records are the trip segments of a tour. Each trip record has an origin and a destination.
Dwell Time	The amount of time in minutes that the traveler was at the destination.
Anchor	Day trip records have a purpose for the trip origin and for the trip destination. These are classified as Home, Work, and Other. Home and Work always terminate a tour. If the anchor is of type Other and the dwell time is greater than 30 minutes, then that also terminates a tour.
Tour	A series of trips between two anchors.
Stop	An intermediate stop (Other) of a tour.

How Tour Records are Created

Day Trip records are traversed in sequence and rules are applied to identify tour boundaries. The Day Trip file sort order is determined by the variables HOUSEID, PERSONID, and a derivation of STRTTIME. The surveyed travel day is in the interval of 0400 to 0359. The derived STRTTIME is created to range from 0400 to 2759. The output dataset, CHNTRP17, contains one record for each Day Trip record. TOUR is an ID variable, an integer from 1 to N for each PERSONID.

Tours defined as home-to-home and work-to-work used the same dwell time rule described above but required two or more outbound stops.

Next, one record is created for each tour with tour-level characteristics. The record keys are HOUSEID, PERSONID, and TOUR. This record includes a number of variables that

describe the characteristics of the tour (e.g., number of stops, total time, total distance, purpose, and mode). The output dataset is named TOUR17.

Contents of the Files

Tables 1 and 2 below describe the variables of the two Trip Chaining files. Table 3 provides summary statistics for all three Trip Chaining datasets in the series.

Table 1. Contents of the CHNTRP17 file

Variable	Type	Len	Label
HOUSEID	Char	8	Household Identifier
PERSONID	Char	2	Person Identifier
STOPS	Num	8	Number of stops for the tour
TDTRPNUM	Char	2	Incrementing travel day trip number, starting at 1 for each person in the file
TOUR	Num	8	Sequential tour number for person (1-N)
TOURTYPE	Char	2	Type of tour
TOUR_FLG	Char	1	1=Yes Part of Tour, 0=Not Tour
TOUR_SEG	Num	8	Sequential location of trip within tour (1-N)
TRPCNT	Num	8	Number of trips that make up the tour
WTTRDFIN	Num	8	Final trip weight

Table 2. Contents of the TOUR17 file

Variable	Type	Len	Label
BEGNTIME	Char	4	Tour begin time (HHMM)
DIST_M	Num	8	Distance longest segment (miles)
ENDTTIME	Char	4	Tour end time (HHMM)
HOUSEID	Char	8	HH eight-digit ID number
MODE_D	Char	2	Mode of longest distance segment
MODE_T	Char	2	Mode of longest time segment
PERSONID	Char	2	Person ID
PMT_OTHR	Num	8	Tour level PMT for other modes
PMT_POV	Num	8	Tour level PMT for POV
PMT_TRAN	Num	8	Tour level PMT for transit
PMT_WALK	Num	8	Tour level PMT for walk
STOPS	Num	8	Number of stops for the tour
TIME_M	Num	8	Time of longest segment (minutes)
TOT_CMIN	Num	8	Tour level calculated minutes of travel
TOT_DWEL	Num	8	Tour level dwell times for intermediate stops (minutes)
TOT_DWEL2	Num	8	Tour level dwell times for all stops (minutes)
TOT_MILS	Num	8	Tour level total miles of travel
TOUR	Num	8	Sequential tour number for person (1-N)
TOURTYPE	Char	2	Type of tour
TOUR_FLG	Char	1	1=Yes Part of Tour, 0=Not Tour
VMT	Num	8	Tour level VMT
WTTRDFIN	Num	8	Final trip weight

Table 3. Weighted Summary Statistics for the 1995, 2001 and 2009 Tour Files

		Tour 1995	Tour 2001	Tour 2009	Tour 2017
Variable	**Label**	**Wgt Mean**	**Wgt Mean**	**Wgt Mean**	**Wgt Mean**
PMT_POV	Tour level PMT for POV	11.22	11.93	11.50	10.90
PMT_TRAN	Tour Level PMT for Transit	0.26	0.16	0.19	0.37
PMT_WALK	Tour Level PMT for Walk	0.04	0.08	0.10	0.12
PMT_OTHR	Tour Level MPT for Other	0.78	1.36	1.23	2.88
VMT	Tour Level VMT	7.46	8.15	7.85	7.57
STOPS	Number Stops before Final Destination	0.37	0.37	0.38	0.33
TOT_CMIN	Tour Level Calculated Minutes of Travel	22.39	27.6	27.72	29.55
TOT_DWEL (TOUR_FLG = '1')	Tour Level Dwell times for All Stops	15.88	17.19	16.88	21.87
TOT_MILS	Tour Level Total Miles of Travel	12.3	13.54	13.02	14.29
TOURTYPE	**Definition of Tour Type**	**% Wgt Trips**	**% Wgt Trips**	**% Wgt Trips**	**% Wgt Trips**
	H-H	10.13	10.57	11.8	10.83
	H-O	24.91	26.48	25.93	24.74
	H-W	10.31	9.84	10.08	11.08
	O-H	26.57	26.85	26.58	26.16
	O-O	11.95	11.36	11.27	10.35
	O-W	2.03	2.08	1.53	1.51
	W-H	9.24	8.85	8.89	9.97
	W-O	2.94	2.65	2.62	2.80
	W-W	1.91	1.34	1.30	2.55
TOUR_FLG	**Trip is Part of a Tour**	**Percent**	**Percent**	**Percent**	**Percent**
	0=No	82.22	81.84	82.24	82.20
	1=Yes	17.78	18.16	17.76	17.80

Differences Between the 2017 Trip Chaining Files and 2009 Release

- The purpose "Work from Home" was added in 2017. This purpose was included with Home trips in determining tour type.
- The variables TOT_MILS and TOT_MIN has been assigned -9 for unreported values. Those values were SAS missing or "." in prior releases.

Differences Between the 2009/2017 Trip Chaining Files and Previous Releases

- The variable TOUR_ID was dropped. In the 1995 and 2001 datasets, TOUR_ID was a unique ID from 1 to the total number of tours. Instead, use the native 'keys', HOUSEID, PERSONID, and TOUR.
- All 'merged' variables have been dropped to reduce file size and duplication. Use the ID variables HOUSEID, PERSONID, and TDTRPNUM to merge with the four NHTS datasets. However, WTTRDFIN is provided.
- TOT_DWEL2 was added. Similar to TOT_DWEL, TOT_DWEL2 includes the dwell time of the destination anchor.